

Mid-Chapter Review

- 7.1**
- Babette spends \$225 a year on lottery tickets. After 15 years, her total winnings are \$1200. Suppose Babette had invested the money she spends on lottery tickets in an account that earns 6% per year compounded annually. How much would Babette have accumulated after 15 years?
 - Harvey deposits \$2500 at the end of each year into an RRSP that earns 9.6% per year compounded annually.
 - Determine the amount in the RRSP at the end of each number of years.
 - 10 years
 - 20 years
 - 40 years
 - Determine the interest earned after each time period in part a.
 - Use your answers in parts a and b to explain the advantages of saving early.
- 7.2**
- Allison wins a lottery. She can receive \$25 000 at the end of every 6 months for 20 years or an equivalent cash payment immediately. Determine the value of the cash payment if money can be invested at 8.5% per year compounded semi-annually.
 - Create an example to show how the present value of an annuity changes in each situation.
 - The regular payment is doubled.
 - The interest rate is doubled.
 - The number of years is doubled.
 - The compounding period is doubled.
- 7.3**
- Pilar needs \$2500 three years from now. How much should she deposit at the end of each quarter at 4% per year compounded quarterly to obtain the required amount?
- 7.4**
- Malcolm plans to invest \$500 at the end of every 6 months in a savings account that earns 5% per year compounded semi-annually.
 - Use a spreadsheet to determine the amount in the account after 2 years.
 - How much more would Malcolm have at the end of the 2 years under each change?
 - The monthly deposits are \$600.
 - The interest rate is 6% per year.
- 7.5**
- What do you think are the two main benefits of using an RESP?
- 6.** Florine borrowed \$25 000 at 9.6% per year compounded monthly to buy a new houseboat. She can repay the money by making equal monthly payments for 7 years or 10 years.
 - Determine the monthly payment for each time period.
 - How much would Florine save in interest by choosing the 7-year loan?
 - Why might Florine choose the 10-year loan even though the interest costs are greater?
- 7.** Elyse borrows \$8000 at 12% per year compounded monthly. She will repay the loan by making monthly payments of \$177.96 for the next 5 years.
 - Use a spreadsheet to create a payment schedule for Elyse's loan.
 - How much does Elyse have left to repay after 3 years?

- 10.** Geneva's parents saved for her college education by depositing \$1200 at the end of each year in a *Registered Education Savings Plan* (RESP) that earns 6% per year compounded annually.
- What is the amount of the RESP at the end of 18 years?
 - How much interest is earned?
 - How much extra interest would have been earned at an interest rate of 7% per year compounded annually?

- 11.** Verena is saving for a new computer. She deposits \$100 at the end of each month into an account that earns 4% per year compounded monthly.
- Determine the amount in the account after 3 years.
 - Does the amount in part a double with each of these changes?
 - The deposits are twice as great, \$200.
 - The interest rate is twice as great, 8%.
 - The time period is twice as long, 6 years.
 Justify your answers.
 - Which scenario in part b produced the greatest amount? Explain.

■ For help with question 12, see Example 4.

- 12.** Jackson and Abina save money for retirement.

Investment Plan

Name: Jackson
 Monthly investment: \$40
 Start: Now
 Time period: 30 years
 Annual interest rate: 6%
 Compounding period: monthly

Investment Plan

Name: Abina
 Monthly investment: \$80
 Start: 15 years from now
 Time period: 15 years
 Annual interest rate: 6%
 Compounding period: monthly

- Compare the amount of each annuity with the total investment.
 - Determine the interest earned by each annuity.
 - Use the results of parts a and b to explain why financial planners recommend saving for retirement from an early age.
- 13. Assessment Focus** Consider these two annuities.
- Annuity 1: \$100 deposited at the end of each month for 5 years at 4% per year compounded monthly
- Annuity 2: \$300 deposited at the end of each quarter for 5 years at 4% per year compounded quarterly
- Calculate the total deposit and the amount of each annuity.
 - Why are the amounts different even though the total deposit is the same?